QUANTA

VOLUME 2 ISSUE 12   **JANUARY 1986**

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INFORMATION ON THE GROUP

Membership of QUANTA (QL Users and Tinkerers Association) is by subscription to QUANTA, the group's newsletter, which is published monthly. Membership details are obtainable from the secretary. Membership of the group is open to anyone with an interest in the Sinclair QL microcomputer.

Members requiring assistance with problems related to the QL may write to or phone the secretary. An attempt will be made to put them in touch with a member who can help with the problem.

Workshops will be arranged from time to time in various parts of the country.

The group maintains a software library. Most of the programs are free to members. A library list will be published from time to time. Programs are obtainable from the sub-librarians.

A list of members in any particular area is obtainable from the secretary.

Please send all contributions to the newsletter to the editor.

Chairman and   Secretary and
Newsletter Editor   Newsletter Publisher

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Quill, Abacus, Archive and Easel are trade marks of Psion Ltd.

NOTES FOR CONTRIBUTORS TO QUANTA

If possible, please send all contributions longer than half a page in machine-readable form (Microdrive cartridge or 40-track disk). Cartridges and disks will be returned A.S.A.P. Lengthy contributions that have to be typed in will go to the bottom of the pile.

Short programs can be included, but lengthy programs should be placed in the library, and a description sent in for the newsletter

EDITORIAL

We now have two different memory expansion techniques. I thought it advisable to continue with the original modification - replacing the 64K RAMS by 256K devices - but Gert Oelker's method of piggy-backing the new chips on top of the existing ones has a lot going for it, as one gets the full complement of 640K, and all the hassle of winkling out the old chips is avoided. What is needed is the best of both worlds - piggy-backing the chips with a PROM or PAL to do the decoding. Even the mighty IBM piggy-back their RAM chips in their AT machine, by the way, with special sockets. Does anyone know where one can obtain these sockets, as they could be used on the QL? Incidentally, it doesn't seem all that long since I expanded my TRS-80 Model 1 from 4K to 16K, at a cost of just over £100, when Tandy were charging over £200 for the upgrade!

Both EMAP's QL User and Computing Age (formerly Electronics and Computing) have folded. It is quite likely that QL User will be taken over by another publication.

Metacomco have won the top prize in the "1985 South West Export Awards". The Duke of Kent awarded them the prize for "Supreme Champion" at a televised ceremony in Bristol, for their outstanding export performance in supplying software services to computer manufacturers overseas.

I expect to receive review copies of Digital Precision's software shortly. I already have their Supercharge compiler, and will be reviewing it in the next issue. Will any members interested in reviewing their Super Forth, Super Astrologer, Super Sprite Generator, Super Monitor/Disassembler, Super Backgammon and Super Arcadia (I hope they really are as super as claimed!) please give me a ring.

I suppose now is the time to look into the future and try to predict what is likely to happen on the QL scene in 1986. All the pundits seem agreed on a new version of the QL, aimed more at the business market, with 512K of RAM, a built-in 3 1/2" disk drive, and a monitor. The Psion packages will probably be in ROM, and I would think that they will be the full Xchange versions, rather than the watered down' versions available on the existing QL. The machine should sell for about £400, with a monochrome monitor, or £500 with a colour monitor, to compete with the Amstrad range.

Leon Heller

MEMBERS' LETTERS

I have some information on Medic Datasystems Limited. Whilst in the U.K. at the beginning of November, after great difficulty I persuaded them to let me call on them for a demonstration. On arrival at Hackwood Lane, I found their office in an asbestos board building in the grounds of a large house: it was in an indescribable mess, with bits of equipment all over the floor, which also appeared to be used for

the filing (sic) system. That day there was no demonstration something was faulty! An appointment was made for a week later to collect a quotation for what I wanted. I called, and a charming girl attended to me, though no one knew anything about my requirements; however, I received the details verbally. I also had a demonstration from a young man. No equipment was available to take away, but I was to phone a week later, as they were expected, likewise the leaflet, which has been arriving next week for a long time. Including obtaining the new telephone number from directory enquiries, repeated phone calls from the U.K., and from Andorra on my return, produced no answer from ringing tone.

One of my books gave me information which, though doubtless known to initiates, reduces the effort of formatting.

FOR a=1 TO 6: FORMAT mdv1_

Congratulations on producing a useful magazine.

Gil Lamb,
Edifici Caries,
Esc. B, Atic B,
La Massana,
Principat d'ANDORRA.

—————————

I read Ron Dwight's letter concerning 'QL World' in Quanta Dec. '85 with some interest. Like Kim, I submit articles and programs from time to time to a number of magazines, including QL World. When one is not commissioned to write an article, any work offered is effectively "unsolicited goods" and its publication or otherwise will depend on numerous diverse considerations such as advertising sales, target readership, merit and, yes, the editor's opinion. I have found QL World to be better than average in their dealings with freelances; conversely I have been waiting six months for payment from another well-known, and at the time of writing, defunct QL magazine. The irony of the situation is that I, like Ron, spent a considerable amount of time developing a screen compression routine and finished it at about the time Ron announced his. I too sent it to QL World for possible publication and it remains as yet unpublished, but that alas is the lot of the freelancer.

With regard to Howard J. Clase's problem No. 2 (Dec. '85) about his inability to RESPR when a clock is running, the answer is in the memory map! At the very top of memory is the RESPR area with the transient program area immediately below it. Once a multi-tasking program is loaded into the TPA by EXEC it cannot be moved, so there is no space above the TPA and below the top of RAM in which to reserve space.

James Lucy,
8 Rookery Lane,
Gt. Totham,
Malden,
Essex CM9 8DF. Tel: (0621) 891715

This is a request for help and advice. The QL is not yet popular in India, therefore software is very scarce and terribly expensive. We don't have any official outlet in India and this adds to our problems. Due to this, students like me (I am studying second year Electronic Engineering) who are beginners in the field of computing cannot exploit our computing talent. This is because we cannot afford to buy the scarce commercial software which is 2-3 times the original price here.

It would be greatly appreciated if members could send me listings of games, educational, business and utility programs from your collections. A cartridge would be welcome - I'll pay for it by IRC (International Reply Coupon - exchangeable for stamps). But please send the cartridge as a gift clearly stating "NO COMMERCIAL VALUE" so as to avoid customs duty in India.

Also, please send me helpful programming tips with the necessary dos and don'ts when using the QL. Hopefully your co-operation and help will make me understand the QL better and use it efficiently.

Vaibhav Dahake,
Dahake Bungalow,
MG Rd., Naupada,
Thane-400602,
MS India.

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It rather surprises me that the library doesn't contain more business software - after all the QL is a business machine. Our QL has already saved £10,000 for my company, working out the wages in a very complicated performance-related system. ,Time permitting, I shall try to generalise some of my own business programs and submit them to the library.

Being a relatively new member, I have not yet been able to catch up on previous stories that have been covered in earlier issues of Quanta. One item I would like to know more about is Charles Dillon's Archive booklet and cartridge. I would like to know where I can obtain them and the cost.

Olle Andersson,
7 Poplar Close,
Old Town,
Poole,
Dorset.

/* Both the Archive booklet and cartridge are available from Brian Pain - just give him a ring. LFH */

During my last trip to London I bought a JR version QL and an Epson RX80 F/T. printer. Can anyone tell me the differences between the FIT and the F/T+? In August I obtained the Psion 2.0 versions and a McGraw-Hill assembler, both without manuals.

The QL is not marketed in Argentina. The dealer representing Sinclair is selling only Spectrums (the old model with the rubber keyboard) but without interfaces, cartridges or joysticks. So, I don't have a local supplier of cartridges, hardware or software for the QL.

When I got my QL, I suppose I was one of the first users in Argentina. Now, there are maybe a dozen others, and I am trying to form a QL users' club here.

Spanish users might find it interesting to know how to use the RX-80 to put accents on vowels without loss of right justification. I use the following statements in INSTALL_BAS:-

```
Preamble code:  27,64,27,77,27,82,7    (initialise, elite, Spanish set)
Translate  1  :  140,39,8,97           (vowel a with accent and backspace)
Translate  2  :  131,39,8,101          (    "  e        "         "     )
Translate  3  :  147,39,8,105          (    "  i        "         "     )
Translate  4  :  150,39,8,111          (    "  o        "         "     )
Translate  5  :  153,39,8,117          (    "  u        "         "     )
```

Ruben Zeida,
Av. Jose M. Moreno 453,
(1424) Buenos Aires,
Argentina.

/* Documentation for the McGraw-Hill editor/assembler is contained in Colin Opie's book on the QL, "QL Assembly Language Programming" published by McGraw-Hill. I don't recommend this editor/assembler package, by the way. The editor is written in SuperBASIC and I have heard that there are some bugs in the assembler.   LFH */

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My enquiries locally have failed to unearth any QL user group here - distribution is still in the early stages and appears to proceed at a crawl. Have you any contacts with Australia and do you know of any user group in the Eastern states (Q'land, N.S.W. and Victoria)? What is the policy of QUANTA towards overseas groups regarding use of info. in the newsletter and other facilities?

Don Atkins,
P.O. Box 23,
Waterloo,
N.S.W.,
Australia 2017.

/* We support local groups in the UK and other countries. Such groups may publish any material from Quanta, provided they credit the original author, and give our address. LFH */

PROBLEM SECTION

In spite of recently purchasing six books on SuperBASIC programming, I have not yet found out how to get my Epson FX-80 to print from the screen, with the exception of programs, and that required a great deal of delving through the Users Guide to find the throwaway statements which tell you the several ways of doing this.

QUANTA is most interesting, but can anyone tell me a book(s), which will instruct a computer illiterate, like myself, what much of it is all about, so that I might be able to make use of some of the information if required.

I find that, with an Epson FX-80 printer, I produce a more acceptable appearance for a personal letter, as opposed to a business one, if I use condensed type (via a Translate instruction), as opposed to the Elite font, similarly obtained. It also enables me to include nearly 50% more rubbish per line, using from position 10 to position 125 characters width in place of 10 to 80.

However, as my Microvitec 653 Cub monitor shows only 80 characters, or is it 79, in Quill,-it is necessary to use the up and down cursor keys to obtain the full width of 115 characters. The use of these keys causes the screen printing to take up the 115 character width. It obviously uses a considerable amount of memory of the little which is left over after Quill is loaded: A few minutes ago, before I had filled even one A4 page, the QL told me it was out of memory. This occurred at about 750 words.

Does anyone know if there is a way of overcoming this problem?

Gil Lamb,
Edifici Carles,
Esc. B, Ditto B,
La Massana,
Principat d'ANDORRA.

How can I use user-defined characters with Quill? I can use them without Quill easily enough, and even with Quill I can use them on the printer by installing them before loading Quill into the QL, but when Quill opens its windows it automatically overrules any character fonts that may have been pre-set.

If Quill could be patched so that it doesn't open the windows in the machine code part of the program, but in the boot program itself, I could succeed. Can any expert machine coder help? Sinclair, QL User and others reckon it can't be done. Psion didn't reply.

I have the Tony Tebby toolkit, with char use and another character font selector written by Jim Henson, who has been very helpful.

R. Page,
10 Station Street,
Tipton,
West Midlands DY4 8WE.

_____

I am one of those who have been taken in by Medic's QL User ads. and reviews, and committed nearly £450 to Medic (dual drives, disks and memory). Now I find out from PCW that the F____ S____ have been called in and it seems that I will not receive my orders nor gain return of my money. I know that there is nothing I can do except wait, but QUANTA may be in a position to apply some pressure on behalf of its members, as I am sure that I am not the only one.

Should I get my money back I will still need a disk system, but cannot establish which company is safe and which product (there are about 12) is good value and reliable. Would it be possible for you to publish a comprehensive review of available products?

Some queries:

Why is it that when Quill reports "Out of Memory" (about 1000 words in bold), that saving the document and reloading it gives more memory?

Is it possible to print very large letters in varying fonts to an M1009? Tasprint's are not big enough for me.

Is it necessary to clean the Microdrive heads and does Qclean work?

Are address labels on a roll to fit an M1009 available?

David McCullagh,
244 Sundrive Road,
Dublin 12,
Ireland

./* People who ordered goods from Medic as a result of ads, in QL User might be able to claim against EMAP, under their Mail Order Protection Scheme. They should write with full details to Neil Wood at EMAP.

Unless the Microdrive heads are dirty, they shouldn't need cleaning. I don't know if Qclean works, but some isopropyl alcohol on a cotton bud (as used on babies) should do the trick. You don't need to dismantle the QL, of course, as the heads are quite accessible. LFH */

_____

When using Metacomco's Lattice C, I have problems using scanf with variables declared as double, for instance:-

scanf("%f", &d);

will not work for variable "d" declared as double. Instead of using "f" you have to use "lf", which is not mentioned in the manual.

M.D. Macgregor,
53 Kersland Street,
Glasgow.

/* "f" should be used for single precision floating point values, and "lf" for double precision. This is mentioned in the manual (p91), with the "l" specified as optional, which seems wrong, but when in doubt it is probably best to refer to Kernighan and Ritchie, where no mention of the "l" being optional is made. LFH */

_____

I have used Kable Singh's solution (Sept. '85, pages 25-26) for different printer typefaces but I am unable to to get the international character sets using translate options (27,"R","n") or intermediate spacing (27,"A",17) of 17/72 inch.

Does anyone know why it is possible to have <ESC>,-1 or <ESC>,0 or <ESC>,W1 or <ESC>,W0 and it is impossible to have <ESC>,R0 or <ESC>,R1 or <ESC>,R7 ?

I have two unresolved problems for listing Archive programs and assembler programs with the McGraw-Hill editor/assembler. Can anyone help? With Archive, I can't list programs with LLIST with, for instance, 10 characters in from the left margin. With the assembler, I am unable to list or print programs.

Ruben Zelda,
Av. Jose M. Moreno 453,
(1424) Buenos Aires,
Argentina.

I* Assembler programs and listing files can be listed by copying them to the serial port. LFH */

_____

In the QL Technical Guide it indicates that SV CSUB, at $A2 offset from the base of system variables, contains the address of the subroutine to jump to on CAPSLOCK. I have completely failed to get this to work, even if the subroutine is as simple as NOP, and I have tried User and Supervisor modes. Can anyone help?

James Lucy,
8 Rookery Lane,
Gt. Totham,
Malden,
Essex CM9 8DF.
Tel: (0621) 891715

/* This had me mystified, as I couldn't get it to work either. Tony Tebby sorted it out. $280A2 shouldn't contain a vector, but executable code. Since there is room for only four bytes, you have to put a BRA in there to your subroutine, which should end with RTS. Tony suggested allocating space for the routine from the heap, as the branch would be out of range, if the routine was placed in the TPA as usual. LFH. */

_____

I need to be able to connect my QL to the phone in order to use the OU's Pascal for course M252 in '86. I have a program "terminal_bas" on an early library tape, by someone called JMR, and a paper listing of Leon Heller's "term". What hardware would you recommend and can I manage with an acoustic coupler without an extension phone line?

Eric Sergeant,
33 Breedon Street,
Long Eaton,
Nr. Nottingham,
Notts. NG10 4ES.

/* Most acoustic couplers are either 300/300 baud or 1200/75 baud, so you will have to find out what the OU computer uses. The QL doesn't work very well when connected directly to a modem; it loses characters sent to it from the remote system, although it seems OK going the other way. It can't handle the split baud rate needed by Prestel-compatible systems either. Miracle Systems sell a low-cost box (£39) called a Modaptor that goes between the QL and the modem, that gets over these problems. It comes with terminal emulation software. Acoustic couplers, whilst cheap, are less reliable than direct-connect modems, so you will probably experience occasional corruption of files during transmission, which might necessitate some editing on the OU system. Miracle Systems are on (0272) 603871. LFH */

ICE BY EIDERSOFT

By far the most important addition to the QL scene since the QL itself was launched is this piece of software by Eidersoft. To use it to its fullest capability it is essential to have a memory upgrade and the 512k upgrade shows it to its best advantage. It is a product which I can unhesitatingly recommend to any prospective purchaser to help them make the most of the QL's much vaunted multi-tasking capability. I do not propose to review it since I expect that will have been done far more expertly before this letter can be printed.

I have at present configured the package to use QUILL, ARCHIVE, ABACUS and ICE at the press of <Ctrl> and <F3>. I have 40k workspace for each of the Psion packages, which is more than sufficient for all my likely requirements, and I have, in addition, four RAM disks with, respectively, 80k, 80k, 50k and 50k reserved on each. I can jump from writing this letter using QUILL into ABACUS or ARCHIVE, or even back to ICE, and then back to this letter at the same place I left off. Indeed I did so in the middle of altering the footer design!

I cannot use the three Psion applications at the same time, in the sense that the three are not on the screen at the same time in separate windows, but I can enter, for example, ARCHIVE to obtain an address or ABACUS to carry out a calculation, and then return to QUILL, without having first to save the letter I am working on, and later reload it. Of course to port any details across between the Psion applications it is necessary to save an export version where applicable and import it into the other application, however if that is done to a RAM disc the time taken is negligible.

So much for the advantages of multi-tasking, for which alone the program is worth buying, but it also provides a very sophisticated front end which is extremely easy to use. Indeed all the chores of disk and cartridge tidying and copying are greatly eased. Household management is now almost a pleasure and there is no longer an excuse to ignore the backup procedures.

Eidersoft and the author, Mr Jones, are to be congratulated on an excellent piece of software. It is a only a pity that the other extract from the same stable, "QSPELL", is not of the same high standard.

However I will not allow my disappointment with that piece of software to colour my judgment on ICE.

The Hon. W.D.R. Spens,
Marsh Mills Cottage,
Over Stowey,
Bridgwater,
Somerset TA5 1HG
Tel: (0278) 732542

"COMPWARE" MICRODRIVE TOOLKIT

The Toolkit is supplied on a single microdrive cartridge and is accompanied by an eight page manual. The manual is A5 sized RED paper (nice), neatly laid out with a copyright notice on each and every page, although it could perhaps have been improved by greater use of justification and the removal of one or two of the spelling errors. The manual begins on the very first page with a warning concerning copyright and informing the user that they are entitled to make a single backup copy. Further copies may be made for use on other machines provided further licences are purchased from Compware.

The programs on the microdrive cartridge are:-

1. BOOT .. A simple program to load the toolkit automatically.
2. MDKIT_BIN .. The toolkit object code.
3. BACKUP .. A general purpose backup utility.
4. READ_HEADERS .. Example read header program.
5. READ_TO_SCREEN .. Example read sector to memory.
6. VERIFY_N_READ .. Example of sector verify and read.
7. WRITE_A_SECTOR .. Example of sector write.

Following this list is a paragraph on making a backup copy of the toolkit and a list of the command extensions contained within the toolkit itself.

Extensions are provided to :-

1. Format a microdrive cartridge with a specific random number in the header.
2. Read a sector header and return the medium name as well as the random number in the header.
3. Read absolute sectors.
4. Verify absolute sectors.
5. Write absolute sectors.
6. Write absolute sectors without verification

This is then followed by a detailed explanation of the microdrive format (which should have been in the QL manual in the first place), the directory and the sector map. References are made to sector allocation and the format of the directory; all good useful stuff here. The next five pages are devoted to a detailed explanation of each of the functions available within the toolkit with example programs to emphasise the use of each of the functions.

What more is there to say except that all the functions provided in the toolkit behaved as detailed in the manual and as expected. This toolkit is not really a beginner's program, as the basic concepts of mass storage, random access magnetic media are assumed to be already understood by the user. As a functional

addition to the "TOOL" box of the experienced user, this is a really worthwhile addition. It is perhaps a pity that the source code is priced so highly, but, where can one find the source code of anything so powerful?

A good package that can be highly recommended, coming, as it does, from one of our own members.

Ron Dwight.
T:mi Softronic
Suvikuja 3 B 14
02120 Espoo
Finland.

DIY 512K RAM UPGRADE (PART 2)

To complete the mod. you need the following components:-

1 off 74LS157 multiplexor
1 off Harris HM-7621A 512 X 4 PROM

Remove the circuit board and remove the connections between pin 1 and pin 8 on the new RAMs, as described in the previous issue, and connect all the pin 1s together.

The PROM is used for address decoding. Only 16 of the 512 locations are used - I used it because I had some available - and a smaller PROM, say, 16 X 4, would suffice.
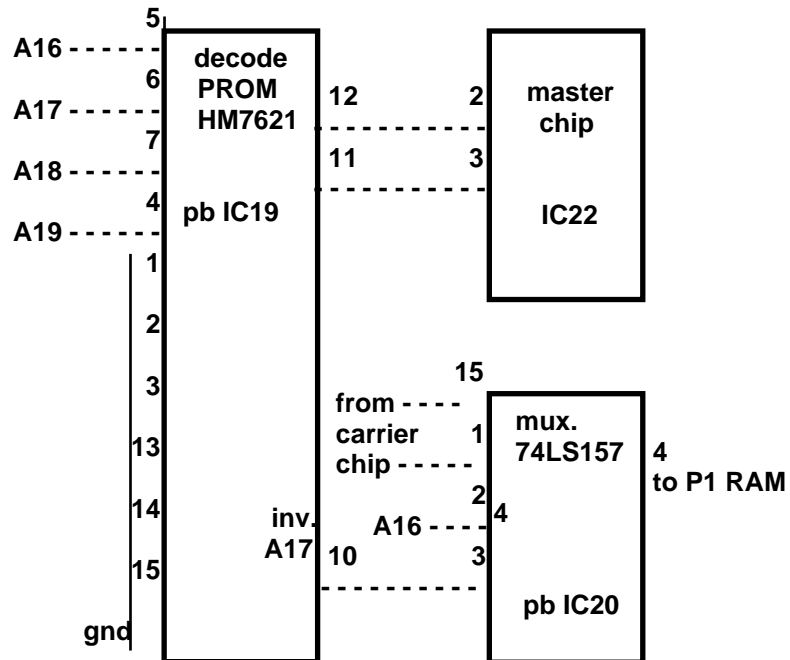
Carefully extract the "master chip", IC22, and bend out pins 2 and 3. Replace the chip.

The 74LS157 is piggy-backed onto 1C22. Cut pins 5, 6, 7, 9, 11, 12, 13, 14 and connect to pin 8 (ground). Bend out pins 2, 3 and 4. Solder the remaining pins 1, 8, 15, 16 to 1C22. Connect pin 4 to pin 1 of the nearest RAM chip. Connect pin 2 to address line A16 (see sketch above)

The PROM is piggy-backed to IC19 for power only. Remove pin 9. Bend out pins 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15. Connect pins 1, 2, 3, 13, 14, 15 to ground on pin 8. Connect pins 8 and 16 to IC19.

Address lines A16 - A19 (pins 16, 17, 18, 19) on the CPU must now be connected to pins 5, 6, 7, 4 respectively of the PROM. Connect pin 10 of the PROM to pin 3 of the 74LS157, and pins 12 and 11 to pins 2 and 3 respectively of IC 22. These should have been bent out earlier.

Re-assemble the unit.

Congratulations! Because you now have lots of free space for "slave blocks", most programs that access Microdrive will run significantly faster. For some reason, Quill also seems to benefit during Copy and Erase.

I can supply the PROM for the nominal cost of two cartridges, or maybe QUANTA can supply them. The programming details are as follows:-

Addr.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
O/P.	4	6	1	1	5	5	3	3	7	7	0	2	4	6	0	2

I've had my 5Mb QL for one week now and it is really a completely different machine. I carry the QL around, and so prefer the internal upgrade to an external box.

The ideas for the design came from Finn Lekanger (Bodo, Norway), who probably had Norway's first 512K QL. The two-chip PROM version is due to John Lloyd Jones and Frank Sorenson (both of Tromso, Norway).

Torbjorn Sund,
c/o Global Data A/S,
P.O. Box 930,
N-9001 Tromso,
Norway.

/* I have just tried the above out on my system, and it works fine. It takes about an hour.

Torbjorn supplied me with a PROM, for which I would like to express my thanks. I made a few minor changes: I didn't bother to ground the unused pins on the multiplexor (probably increasing the current consumption slightly) and I used a 33R series resistor between the multiplexor output and the RAMs, to prevent any ringing that might occur as a result of the capacitive nature of DRAM inputs. Sinclair uses them on the other address lines, and it might prevent problems with reflections and other "nasties".

An HM-7603 32 X 8 PROM could be substituted for the one used by Torbjorn, with the upper data lines unconnected, and might be somewhat cheaper, or a single PAL could probably be used to replace the decoder and the multiplexor. The mod. would be easier if the chips were mounted on a small PCB. I'll look into these options. LFH */

SUBSTITUTING EPROM FOR ROM

It is possible to replace the two ROM chips inside the QL with EPROMs containing your own program or operating system. However, plugging ordinary 27256 EPROMs into the ROM sockets requires some changes to the main board.

The problem: ROM 1 (IC33) has an inverted Output Enable (pin 22) as compared to 27xxx EPROMs, and ROM 2 (IC34) has both Output Enable (pin 22) and Chip Enable (pin 20, address line 15) inverted. Invert these signals and you can insert 27256 EPROMs.

My mod. is described below. It is somewhat complicated, but has the advantage that no soldering is done on the inserted EPROMs. IT IS NOT RECOMMENDED UNLESS YOU HAVE ACCESS TO GOOD DESOLDERING EQUIPMENT AND EXPERIENCE WITH HARDWARE CONSTRUCTION AND MODIFICATION.

Remove the two ROMs. Remove the two sockets. Prepare two "double-sockets", each consisting of a piggy-backed low-profile socket pair. The lower socket is connected to a 74LSO4 inverter (power, ground, CE, and A15 for ROM 2) which lies in the space formed by the two sockets. The upper socket is inserted straight into the lower, except for the pin(s) which should have the inverted signal(s). This pin(s) is(are) isolated from the lower socket, and is(are) instead connected to the proper LS504 outputs. Solder the sockets to the main board, and voila, your customised QL is ready (when you have programmed and inserted the EPROMs).

There are two inconveniences. Firstly, the height margin is very small, and you may have to unscrew and discard one of the screws that fasten the keyboard assembly together. Secondly, the mod. works only with 27256s in BOTH positions, and hence puts the entire $0000 - $FFFF ROM address range on the main board, whereas extension ROMs to be inserted at the back are ordinarily allotted the range $C000 - $FFFF (16K).

The QL's ROM design is a neat trick (probably one of many) inside the machine to save "glue" chips. Full credit goes to Frank Sorenson (Tromso, Norway) for deciphering the QL circuit and for designing and making the special-purpose replacement sockets.

The above mod. is probably not of much interest to English users. I've used it to change the keyboard layout and the character generator, so that I have the additional Norwegian characters available.

Torbjorn Sund,
c/o Global Data A/S,
P.O. Box 930,
N-9001 Tromso,
Norway.

/* The above mod. should be easier if you have one of the earlier machines, as they were jumpered to accept ROMs or EPROMs. LFH */

RETURNING TO QUILL FROM INSTALL_BAS

I wonder if everyone who uses more than one type of printer does what I do with Quill? After using INSTALL BAS it was always annoying to be returned to SuperBASIC instead of directly to Quill, which is what one usually wants.

The simple solution, using a backup Quill cartridge, is to LOAD and LIST INSTALL BAS, and then EDIT lines 246 and 250 to read:-

```
246 CLS:CLS #7:PT col,8:PRINT pet$;"go back to Quill"
250 WINDOW #2,256,200,0,0:PAPER #2,7:INK #2,2:CLS #2: LRUN
      mdv1_boot:STOP
```

This automatically boots Quill on leaving the installation.

Andrew Brown,
Dept. of Oral Surgery,
John Radcliffe Hospital,
Headington,
Oxford OX3 9DU.

ANOTHER DIY RAM EXPANSION

I have fitted sockets on top of the existing RAMs, for the 16 additional 256K RAMs, giving a total of 640K. Pins 1 and 15 are not connected, since they have to be wired to my bit of extra decoding. You have to be very careful when doing this, and use a good soldering iron.

I have made a small board for the three chips (74 LS 138, 74 LS 32 and 74 LS 86). It is placed above the CPU and CLA (IC22).

IC20b (74 LS 257) is soldered on top of IC 20 with pins 16, 15, 8, 1 connected.

CAS/256a (CAS/5-80000) is wired to all 256K chips on top of IC1 to IC 8.
CAS/256b (CAS/9-C0000) is wired to all 256K chips on top of IC 9 to IC16.

IC27b is soldered on top of IC 27 with pins 7, 14 only.

I have arranged the decoding so that if someone wishes to use 64K chips (for 128K expansion), he doesn't have to use the 74 LS 21, but can take the output from the 74 LS 138 pins 15 and 14.

DIAGRAM ON PAGE 31.

I have given all this information to a friend, and he got it to work, apart from three bad joints, even though he knows little about electronics.

Gert Oelkers,
Haspegardsvej 53,
2880 Bagsvaerd,
Denmark.

SIMPLE 4-BIT INPUT PORT

The simplest way to implement an input port on the QL is to use the ROM cartridge slot at the back of the machine. To try the idea out I mounted a 74 LS 125 upside down on one of the Care Electronics EPROM cartridges (I suppose the dongle some members retained when returning their early QLs would do) using a small piece of Blu Tac, and wired the pins to the EPROM socket pins, as in the diagram below. This assembly technique has often been used by Sinclair for their famous bodges on earlier machines like the Spectrum, and is usually referred to as the "dead cockroach" method of construction. Remember to remove the EPROM, if one is present and ensure the power is off when inserting or removing the cartridge.
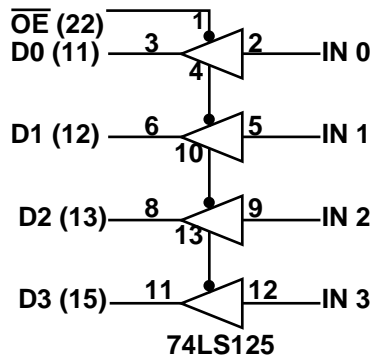
Note: Figures in brackets refer to EPROM pin numbers.

The port can be read by PEEKing address $C000. An 8-bit port could be implemented using a 74LS244 device. Although an output port would probably be more useful (it's more difficult to implement but I hope to have one in the next issue), an input port has several applications. I intend to use it to interface a chord keyboard (like that on the Microwriter) to the QL. It could also be used for a mouse, an analogue/digital converter for temperature measurement, or even, with a couple of op. amp. filters and zero-crossing detectors, for simple speech recognition.

Leon Heller

JOSS BY WD SOFTWARE

JOSS (an acronym for 'Joystick Operated Software System') is claimed to be a time-saving utility which allows various options such as loading and running programs, copying and deleting files, and formatting new media, to be selected via a joystick or the arrow keys in conjunction with the fire-button or space bar. JOSS is available on Microdrivs or disk. The disk version may be used with Microdrives, but the Microdrive version must be upgraded if the user subsequently gets disks. I " tested the disk version, using the keyboard rather than a joystick, as I felt that a typical user would not have a joystick.

JOSS is supplied with a six page manual.

The program loads and runs automatically when the machine is booted, and displays a rather cluttered screen divided into about 10 regions, differentiated by colour. The documentation refers to these regions in terms of their colour, which is unfortunate if, like me, the user has a monochrome display. "WDSoftware1961" is displayed at the top of the screen, with no spaces. The first 18 file names are displayed in a large window on the left of the screen, with a blinking arrow pointing at the topmost file name. Various options are displayed on the right of the screen, in several regions. A blinking cross-shaped cursor can be moved about on the right of the screen, placed on an option, such as, "Load", and then the space key pressed. The cursor then has to be moved to a region of the screen containing "pointer down up", to move the pointer up or down with the space key. I found this use of both a pointer and a cursor somewhat confusing. All the options are displayed in text form; there is no attempt to use icons, as on the Mac or with GEM. This is claimed to be a good feature!

The first thing I did was to set the current date. This is done by positioning the cursor over the date at the top of the screen and pressing the space key. The directory window is cleared and one is told to press the space key again to change the date. One is then prompted at the bottom of the screen for the year. I found it would accept more than four digits, as it did for the hours, minutes and seconds. The number of days in the month was error-trapped up to a point, but it accepted an entry of 29 for February in a non-leap year. When it was displayed at the top, Feb. 29 had been transmogrified into March 1, which is one way of doing things, I suppose. The extra digits I had typed for the hours, minutes and seconds were not displayed. The cursor was always positioned directly after the prompt, whereas an intervening space is usually regarded as more "user friendly". It is usual when checking user input for errors, to indicate the error to the user, and make the user correct the error, rather than just chop off the additional digits.

I found that if I tried to LOAD an EXECable file, I was dumped out of the program, and a similar thing happened if the cursor was placed over "Do current option", and the space bar pressed. These errors should have been trapped.

JOSS had obviously been compiled, and on examination with a file dump utility I found that it had been written in SuperBASIC and compiled with Simon Goodwin's Supercharge compiler. Error trapping is even more essential with compiled programs, as one cannot use "retry" or "continue" as one can in interpreted SuperBASIC programs to get back into the program.

Various other SuperBASIC programs were present on the disk. For some reason these hadn't been compiled, which was probably just as well since none of them had any error-trapping whatsoever.

A disk/Microdrive backup utility is provided. For some reason, a cursor isn't displayed when the user is prompted for input, and funny things happened when an attempt was made to select Microdrive 9. The error was detected, but part of the prompt got overwritten with the error message, and the program eventually seemed to get confused, and wouldn't accept any more input. The average user wouldn't keep inputting rubbish as I was doing, but it's a good way of finding bugs.

A file print utility, qprint_bas, is coded in a rather amateurish fashion, with the instructions displayed with a space at the beginning of the second line, and the terminating period on a line all on its own. Pressing the wrong key in response to the request for floppy or Microdrive resulted in the prompt being repeated. If this was done several times the whole screen scrolled.

I don't really see the need for this package. Most users tend to have a single application on each disk or Microdrive and it is quite easy to write your own menu-selection programs, if you develop your own software, which are just as fast, if not faster, than JOSS in operation. It isn't a lot of use if you are writing in C or assembler, or using the Psion packages. We have much better backup utilities in , the library. The various bugs are rather off-putting, and I didn't find the program particularly easy to use. I don't recommend it.

JOSS costs £15, if the purchaser supplies the disk or cartridge, and is available from:-

WD Software,
Hilltop,
St. Mary,
Jersey, C.I.

Leon Heller

Q-CALC BY PSIENTIFIC SOFTWARE

Q-CALC is an "on-screen" calculator, written in machine code, which will multi-task with other programs. It is supplied on Microdrive, and is also suitable for operation with disks. A four page manual is provided.

The calculator is run by typing "EXEC FLP1_CALC", and <ENTER>. Pressing <CTRL-N> turns the calculator on, and <CTRL-0> turns it off. A true windowing technique is used, so that whatever was under the calculator when it was turned on is replaced when it is turned off. The calculator is displayed on the right of the screen, and may be moved around the screen using <SHIFT> in conjunction with the arrow keys. This also uses the windowing feature, so the contents of the screen are not obliterated when the calculator is moved. Just pressing the arrow keys on their own moves a small pointer around the screen, which may be used to "press" the calculator keys, by placing the arrow on the desired key, and then depressing the space bar. I found it rather difficult to control the arrow, and used the alternative method of keying in the input values and operators from the QL keyboard. When multi-tasking the calculator with another program, the pointer movement slows down considerably, and it is much easier to control. The calculator may be "killed" with <CTRL-K>.

Q-CALC is a fairly standard four-function device, with a percentage key and a single memory. After an operation has been performed, the last key pressed is displayed after the result, as a reminder. Several Q-CALCs may be multi-tasked, using <CTRL-C> to switch between them.

A simpler mini version is provided for use with programs that take a lot of memory, like the Psion packages. With expansion memory, this shouldn't be a problem, of course, and the standard version may be used.

Q-CALC works very well, and is good value at £7.00 (normally £9.95) to QUANTA members from:-

Psientific Software,
37 Cottesmore Road,
Hessle,
North Humberside HU13 9JQ.
Tel: (0482) 649187

Leon Heller

BELGIAN WORKSHOP

The Belgian group is organising a weekend workshop on 14/15/16 February 1986, in Antwerp. Tony Tebby and Leon Heller will be attending. Further details from:-

Ian Johnson,
Kleinemolenweg 233,
2090 Stabroek,
Belgium.
Tel: 03/568.99.68

CENTRONICS GLP - A QL COMPATIBLE PRINTER

To anyone looking for a fully QL compatible dot matrix printer at a budget price, I can fully recommend the recently introduced Centronics GLP. This is basically a version of the Brother M1009 with upgrades including a near-letter quality (NLQ) facility. Unlike any other printer I know, Centronics make a version with the QL character set. Provided this version is purchased there will be no problem in interfacing. RS-232 input is standard; the Sinclair-supplied RS-232 lead plugs straight into the printer and a sheet is included With the manual to give the required DIP switch settings for 8-bit no parity operation. Since the character set matches the QL no translates are required with Quill and, more importantly, printouts from BASIC will be reproduced exactly as on the screen with no transposed symbols.

The control codes are basically as the Epson FX80 with the addition of NLQ, therefore the FX80 printer file, with translates and preamble removed, is used with Quill. The Easel FX80 graphics dump routine also works, with no changes required to any DIP settings after text printing. The disadvantage of this model is the speed, about one third of most other dot matrix printers. It lacks a form-feed button, but this can be overcome by pressing line-feed until the skip perforation operates. There is also no italics facility, otherwise all the usual features of a modern dot matrix printer are there. It is smaller than average size and is on sale at a very competitive price, making it ideal for the occasional user such as myself. I find the print quality good with but one small complaint; in NLQ the numeral 'one' prints the same as the lower-case letter 'l'. However, as the character set is held in EPROM it is possible to alter it; watch this space! The characters with codes 128 to 255 print the same in NLQ as draft; this may be of significance to scientific writers or foreign members.

To be sure of purchasing the QL version rather than the IBM PC version, print the character set by switching on whilst pressing the line-feed button. Check that the copyright symbol prints at the fifth position after the lower-case 'z'. You don't need the computer to do this so it can be done in the shop.

John Attwood,
22 Wilcot Avenue,
Watford WD1 4AT.

IO QUEUE HEADER BLOCKS

Adrian Dickens' "QL Advanced User Guide" covers much of the information needed to make full use of the QDOS operating system. However, there is one small area on the subject of I/O queues which he does not adequately explain. Normally you interact with an I/O queue through the standard vectored queue handling routines (IO.QSET, IO.QTEST, IO.QIN, IO.QOUT and IO.QEOF), but if you want to interact more directly with the queue then you will need to know the precise meaning of the four long words which form the header for a queue. Since Dickens does not go into detail on this, the information is given here for anyone interested.

1st. long word: The most significant bit is set to indicate 'end of file' (i.e. logically closing the queue), and the remainder of the long word is intended for use as the link pointer to the next queue's header.

2nd. long word: Points to the end of the queue. In common with the definition of 'end' throughout ODDS, this means that it points to the address AFTER the last byte of the queue's address space.

3rd. long word: Pointer to where the next byte is to be inserted into the queue.

4th. long word: Pointer to where the next byte is to be removed from the queue.

The queue is organised as a circular or ring buffer. This means that, so long as the input pointer never catches up with the output pointer, the queue has an infinite capacity. Note that when the input pointer equals the output pointer, then the queue is logically empty, and that this results in the physical capacity of the queue being one byte less than its actual length.

Many thanks to Brian, Leon and Tony Tebby who helped me find this out!

Colin Horstmann,
Rowan Cottage,
Westoning,
Beford MK45 5JA.

/* If anyone wants to learn more about queues, they are discussed at length in Knuth's classic "The art of computer programming: Fundamental Algorithms", published by Addison-Wesley. LFH */

PRO FORTRAN-77

Prospero Software have released Pro ForTran-77 for the QL. Sinclair were originally going to market it, but it is now available direct from:-

Prospero Software Ltd.,
190 Castlenau,
London SW13 9DH.
Tel: 01-741 8531

Prospero are renowned for their Pascal (the first micro implementation to achieve ISO validation, I believe) and ForTran compilers running under CP/M and PC-DOS and MS-DOS and are a very "user-friendly" company. They write all their software in Pascal, by the way. I've' suggested to them that a C compiler would be a good idea.

Leon Heller

LENSLOK ET AL

Can I start by stating that I BUY a lot of software for CP/M, Spectrum and QL.

I am however incensed by what is happening at the low-cost end of the market, where by sheer idiocy we are being forced to resort to untangling contrived anti-copying devices or not buying at all.

Today I went to my local retailer to buy Digital Precision's new SuperBASIC compiler. I came away £50 richer because I refused to pay such a sum for software which needs a "Sherlock Holmes" approach each time it is loaded. If you have ever used the stupid "Lenslok" system you will know what I mean. I have already returned the Spectrum version of "Elite" to Firebird for the same reason.

I can of course understand the reasons for using the system but like all others before it, it will be beaten by the pirates. Meanwhile we who pay continue to suffer.

Surely the sensible policy is to provide good quality documentation, and indeed with Firebird's Elite this is done and I defy any pirate to run the program happily without it. At £15 without Dr. Watson's friend it would be good value. I have told them that I think their marketing policy is very shortsighted, but perhaps I'm in a minority.

The SuperBASIC compiler on the other hand has poor material quality documentation. I have not reviewed the contents in depth, but it is written on "toilet paper" and is supplied to go into the already overfull QL manual. For the price, or a little extra, they could have provided high quality paperwork, like that from Sinclair, with a binder to match.

As a result I shall have to content myself with all the goodies from QUANTA. Has anyone got another SuperBASIC compiler?

Brian Oliver,
"Bali-Hi",
Freemantle Road,
Belvedere,
Kent DA17 6ES.

/* The Supercharge documentation looks alright to me, although I agree that they should have provided a binder. On the subject of Lenslok, I have just heard that someone in Belgium can decipher the code visually, most of the time, without using the Lenslok device! LFH. */

MUSIC SYNTHESISER

I have just added a digital-analogue converter to a small MC68000 system, which is interfaced to the QL via the RS-232 interface. The MC68000 system executes programs in RAM with no wait states, at 8 MHz, so it should be pretty good at music synthesis, with some suitable software, which I am working on at present. The ultimate goal is to have some high-level software on the QL, written in C, generating the codes for a particular passage of music, which are then downloaded to the synthesiser RAM to be played.

Leon Heller

ERGONOMICS

Members using their QLs intensively might be interested in some recommendations culled from the ergonomics literature.

You should be able to use the keyboard with your forearms roughly horizontal, with the fingers in line with the forearms when in the "home" position on the keyboard. You should be seated with an angle of more than 90 degrees between the thighs and lower legs, with the feet flat on the floor. A footrest can be useful, if the chair is too high.

The top of the display should be roughly 20 degrees below the level of your eyes, so that you are looking down most of the time.

A monitor is essential, rather than a TV, and colour monitors should be avoided, especially for word-processing and program development. Monochrome monitors have much better resolution, and text in different colours can result in visual accommodation problems - for instance, red and blue cannot be focused simultaneously.

You should not use the system facing a window, or so that reflections from windows or lighting are visible on the screen. Clean the screen regularly - fingerprints and dust can be distracting.

Try not to have trailing leads running over the floor; it can be dangerous if someone trips, and you might lose a lot of data if something gets disconnected.

There is no such thing as eye strain, according to the experts, but general fatigue and aches and pains caused by poor posture often cause visual discomfort and headaches. Intensive use of a computer can make any existing visual problem (like uncorrected short sight) more noticeable.

There is no hard evidence that radiation from displays is harmful. This might not be the case for TVs, which are designed to be viewed from a distance of several feet. Colour TVs can emit a fair amount of ionising radiation (X-rays to the uninitiated); another reason for not using them with a computer.

For further information, have a look at the following publications:-

Cakir et al: The VDT Manual. Wiley.
Grundy and Rosenthal: Vision and VDUs. AOP.
Office Technology - The Trade Union Response. APEX.
Damodoran et al: Designing Systems for People. NCC.

I had a hand in some of these publications, in a previous incarnation. I don't get any royalties, if anyone thinks I have an ulterior motive in recommending them. In the next issue, I'll make some suggestions about software design.

Leon Heller

SOLVING SIMULTANEOUS EQUATIONS

The following program, written by Stan Misel, was originally published in the April 1985 issue of the newsletter of the Amateur Computer Club of New Jersey. Their address is:-

ACC-NJ,
P.O. Box 319,
South Bound Brook,
N.J. 08880,
U.S.A.

As published, the program was obviously written for a Unix C compiler, and I had to make a few minor changes to make it acceptable to the Metacomco Lattice C compiler. Does anyone know what the "void" type denotes - the original program had functions parse, gauss and backtrak of type "void"?

I have the program on disk if anyone wants a copy.

Leon Heller

```
/*
** simult_c by Stan Misel
*/

£include <flp1_stdio_h>

£define MAXEQ 20 /* max. size of arrays to store coeffs. */

double atof();

Main(); {

    char    buf[BUFSIZ];
    int     n, k, row, index;
    double  coef[MAXEQ] [MAXEQ];

    cls();
    printf("\n\nHow many equations? ");
    gets(buf);
    n = atoi(buf);
    if (n <= 0) {
       printf("Not a valid number\n");
       exit(-1);
    }
    printf("Enter the coefficients of the equations separated by spaces\n");
    printf("Note: the first coefficient of the first equation cannot be zero!\n");
    for (k = 1; k <= n; ++k)  {
        printf("Equation number %d ==> ", k);
        row = k - 1;
```

```
          gets(buf);
          parse(buf, coef[row], n);
     }
     for (index = 0; index < n - 1; ++index) {
          pivot(coef, n, index);
          gauss(coef, n, index);
     }
     backtrak(coef, n);
     printf("\n\nSolutions:\n");
     for (row = 0; row < n; row++)
            printf("X%d = %f\n", row + 1, coef[row] [n]);
}


/*
** parse - stuffs blank separated numeric ASCII values into a row of a 2-d array. The
**values may be integers or real. Numbers entered may have a leading minus sign,
**but no plus sign. Do not input any extraneous spaces or parser will complain and
**end program. It will also quit if the number of equations or unknowns is inconsistent.
*/

parse(str, list, nel)
char *str;
double *list;
int nel; {

     char tmp[20], *ptmp, c;
     Int    i = 0;


     while(1) {
          ptmp = tmp;
          while ((c = *str++) != ' ' && c != '\0')
               *ptmp++ = c;
          *ptmp = '\0';
          *(list + i) = atof(tmp);
          ++i;
          if (i > nel + 1) {
               printf("Too many elements\n");
               exit(-1);
          }
          If (c == '\0')
               break;
     }
     If (i != nel + 1) {
```

```c
                printf("Not enough elements\n");
                exit(-1);
        }
}
/*
** pivot - implements the PIVOT routine described by Dence to select rows for
**Gaussian elimination that would suffer least from inevitable computer roundoff
** errors
*/

pivot(arrayp, nel, index)
double arrayp[][MAXEQ];
int nel, index; {
        int row,col,pivrow;
        double  maximum[MAXEQ];
        double x;

        for (row = 0; row <= nel; ++row) /*initialise max. array to zeros */
                maximum[row] = 0.0;
        for (row = index; row < nel; ++row)
                for (col = index; col < nel; ++col)
                                maximum[row] = ((x = abs(arrayp[row] [col])) > maximum[row])
                                        ? x : maximum[row];
/*
** the array maximum[ ] contains the values of the largest elements in each of the
** rows of the array, exclusive of the rightmost element.
** Now we will find the pivot row.
*/
        pivrow = index;
        for (row = index; row < nel; ++row) {
                maximum[row] = abs(arrayp[row] [index]) / maximum[row];
                pivrow = (maximum[row] > maximum[pivrow]) ? row: pivrow;
        }
/*
** We are finished with the pivot array maximum[ ], so we can  use it as a swap area
** to move our pivot array to the first row.
*/
        for (col = index; col <= nel; ++col) {
                maximum[col] = arrayp[index] [col];
                arrayp[index] [col] = arrayp[pivrow] [col];
                arrayp[pivrow] [col] = maximum[col];
        }
}
```

```
/*
** gauss - multiply and add rows in the matrix to reduce to
** one equation for one unknown
*/

gauss (arr, nel, index)
double arr[ ] [MAXEQ];
int nel, index; {

    int row, i;
    double factor;

    for (row = 1 + index; row < nel; ++row) {
        factor = - (arr[row] [index] / arr[index] [index]);
        for (i = index;  i  <= nel; ++i)
            arr[row] [i] += factor * arr[index] [i];
    }
}

/*
** backtrak - solves for all variables after the array was reduced by the Gaussian
**elimination function.
*/

backtrak (array, nel)
double array[ ] [MAXEQ];
int nel; {

    int step, col, row;

    --nel;
    array [nel] [nel + 1]   /= array [nel] [nel];
    array [nel] [nel] = 1;
    for  (step = 1; step <= nel; ++step)  {
        row = nel - step;
        for (col = row + 1; col <= nel; ++col) {
            array[row] [nel + 1] = -array [row] [col] * array[col] [nel + 1]
                + array[row] [nel + 1];
            array [row] [col] = 0;
        }
        array [row] [nel + 1] = array [row] [nel + 1] / array [row] [row];
        array [row] [row] = 1;
    }
}
```

NUMBER OF DAYS BETWEEN TWO DATES - A BUG

Some time ago I published a program containing two functions which, returned the number of days between two dates. It has been brought to my attention that there is a bug in the second function - zeller - which causes it to return a negative value (clearly wrong), if one of-the dates is the 28 February. The first function - schecter - appears to be OK, so this is the one to use. I'm sorry about any inconvenience this has caused.

Leon Heller

LIBRARY CORNER

We have lost another of our cassette librarians, Martin Grew and welcome Johan Boman who will now cover Scandinavia. Many members will miss Martin and will wish to join me in expressing their appreciation of the service he has given during the period I have been librarian. Johan is librarian for the Gothenburg group who meet regularly at the University and will be pleased to hear from any other members in Norway and Sweden. The group publish their own newsletter and mutual help is available on QL problems.

The library currently runs to 28 cartridges including the two library guides giving details of all the programmes held in the library. These are obtainable by sending the £3.00 option charge, two formatted cartridges and a stamped addressed jiffy bag to your nearest microdrive sub-librarian but one cartridge must format to at least 218 free sectors or the first library guide may not copy. The guides will be updated free of charge periodically by your sub-librarian provided you return the original cartridge and enclose return postage and packing. Members requiring library 8 or an update must send three Cartridges, one of which must format to a minimum of 220 sectors, and another a minimum of 218 sectors.

Payment for options should be made by a cheque made out to IQLUG with a note of the options required on the back of the cheque. Sub-librarians have no facilities to debit credit cards and such requests have to be ignored. In general they cannot supply Microdrives but special arrangements may be available from overseas sub-librarians. In case of difficulty cartridges and 5 1/4 floppy disks can be obtained from the Head Librarian at £2.00 each in addition to the option charges and 3 1/2 disks at £5.00 each from Jerry Tresman. These prices include postage and packing by surface mail to any address, airmail being extra. Overseas members without a national sub-librarian may obtain the complete library on 28 cartridges for £80 direct from the Head Librarian.

Members requiring programs to be supplied on disk should allow six cartridges to an 80 track d/s disk and 3 to a 40 track d/s. Single sided disks will be half these quantities. Requests should normally be for complete cartridges but some librarians may be prepared to supply individual programs if time permits. There is however likely to be a delay for this because of the extra work involved and we would expect members to take the complete cartridge and delete any programs they do not require themselves.

If you have a program you feel might be of use to other members please donate it to the library. If you are not too sure about it Brian Davies will be pleased to advise you. Your librarians are listed below.

CARTRIDGE LIBRARIANS

Stephen Hewitt,
Portsdown Vicarage,
Portsdown Hill Road,
Portsmouth, P06 1BE.
Tel: (0705) 375360

Mark Cumming,
117, Station Road,
Kings Heath,
Birmingham.

Alex Robertson,
12, Bude Close,
Crewe,
Cheshire CW1 3XG.
Tel: (0270) 257758

DISK LIBRARIANS

James Methley,
4, Adamslie Crescent,
Kirkintilloch,
Glasgow.
Tel. 0417 762938
(5 1/4 disks only)   .

Jerry Tresman,
61, Ashdown Road,
Chandler's Ford,
Hants. SO5 1QX
Tel. 04215 63129
(3 1/2 disks)

NATIONAL LIBRARIANS

FINLAND

Ron Dwight,
Suvikuja 3 B 14,
02120 Espoo 12,
(3 1/2 6 5 1/4 disks, cartridges,)

SWITERLAND

Wolfgang Goller,
Rosenstrasse 21,
CH 8105 Regensdorf
(5 ¼ discs, cartridges)

SWEDEN

Johan Boman,
Molndalsvagen 7,
S-412 63 Gothenburg,
(Cartridges only)

BELGIUM

Peter Jones.
Ave. G. Mullie 6,
Bruxelles.
3 ½ discs, Cartridges

ADMINISTRATION

QUALITY CONTROL

Brian Davies,
72 Wharncliffe Street,
Hull,
Humberside HU5 3LY.
Tel: (0482) 43700.
(New library submissions only,
no copying facilities)

Syd Day.

HEAD LIBRARIAN

Syd Day,
241, Highfield Road,
Romford RM5 3AW
Tel: (0708) 272572
(Overseas Countries without a Librarian)

MEMORY EXPANSION

The QUANTA library provides a good way of exchanging program ideas. I would like to suggest that-a complementary hardware library be set up to make available circuits and notes-of hardware extensions that members have designed and constructed. I feel that those members with the practical knowledge to do their own construction would benefit from such a service. As a starter, how about some notes on how to do an internal RAM upgrade.

Regarding internal memory expansion, does any member have information on the relative speeds of BASIC or machine code programs resident in normal RAM, internal RAM expansion and external RAM. I believe the latter, like ROM and EPROM, can be-accessed faster because, unlike the existing RAM and internal expansions, it is not shared with the video generator.

I've timed the program below on an unexpended QL, and also with the same machine code in EPROM at $C000. The machine code comprises a loop containing MOVEQ and DBRA instructions executed 65536 times. The results of 7.32 and 3.97 µs respectively show a speed increase of 1.84, times in EPROM. Other self-contained programs tested gave similar. improvements when in EPROM. Practical-programs, BASIC or machine code, will however, give a less dramatic difference since they will inevitably make use of code already in the QL's ROM. Perhaps the editor would publish members' timings on various makes of internal and external RAM upgrades?

A16 to 19 are all from back of Expasion connector.
2,3 on CLA(IC22) are lifted. CAS2/ to old QL mem: Where pin 10 is lifted from CAS/2 from CLA is from lifted pin 10 IC22
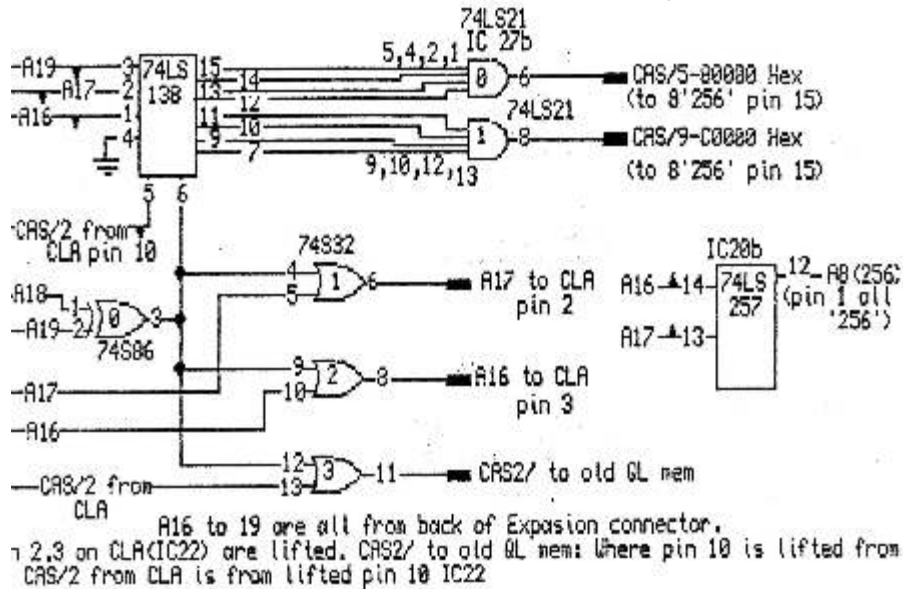
```
100 REMark PROGRAM TO MEASURE MACHINE CODE EXECUTION SPEED
110 RESTORE: X = RESPR(14)
120 FOR K = 0 TO 13: READ N: POKE X +K, N: END FOR K
130 POKE_W 163886, 0
140 CALL X
150 PRINT PEEK_W(163886) / 50 / 65536 * 1E6; " MICRO SEC / LOOP"
160 DATA 48,60,255,255,120,0,81,200,255,252,66,128,78,117
```

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Watford WD1 4AT.

/* This looks like an interesting project. I'll publish any timings that are sent in, of course. I would think that machine code programs would show the most benefit from being run in external RAM, since they will probably make less use of the ROM than SuperBASIC programs.

MORE ON TRANSATLANTIC TV DISPLAYS

I can now add more information on the differences between the TV display areas of the QL in the US and UK models. This is based on experience with my own JSU model, and what I can glean from the literature on the UK version.

The system variable flag is located in a byte at 163890 in both versions (as far as I can see from POKEing about it is bit two of this byte which is the flag, as long as bit two is zero, numbers above 127 have no effect). When I PRINT PEEK(163890) in monitor mode I get 0, and in TV mode the value 2 is returned. POKEing in the other value at this address seems to have no effect until NEW is entered, when the machine changes the form of. the display, but without losing any resident procedures. Window sizes, PAPER and INK values, and even MODE are also unchanged. In the JSU version this isn't a very good idea if your windows are the default ones for either monitor or UK TV displays, since window #0 fall's off the-bottom of the screen and you can no longer see your commands as you type them in, although they are in fact still accepted. This is, I think, responsible for the idea that, UK programs .don't work* on JSU machines in TV display mode. There are similar problems with UK programs for the Acorn BBC fitted with the US ROM.

When-I switch to TV display on my monitor, the active screen contracts vertically so that the top and bottom 32 pixels are no longer used, but the top active line is still addressed as line 0. This seems to be different from UK versions. The width is unchanged, but of course the edges would not appear on a TV screen. The total area used by the default windows on an NSTC TV is 420 X 192 pixels. The sizes of the JSU TV default windows are set by:-

```
100 WINDOW,512,256,0,0: PAPER 0: CLS
110 FOR i = 1 TO 2: WINDOW #i,420,160,46,0
120 WINDOW #0,420,32,45,161
130 FOR i = 0 TO 2: CLS #i
140 REMark Choose your own PAPER and INK!
```

The default screen displays 20 lines of 35 characters in MODE 8, (20 X 70 in MODE 4). Simple arithmetic reveals that the characters are written in a 12 X 8 matrix instead of the 12 X 10 matrix described in the manual. In fact, the letters are the same size, but the two blank rows of pixels between text lines are omitted. Similarly, changing from 80 to 64 characters just adds an extra column of black pixels between the letters.

This information should enable programmers to write programs compatible with the various display formats. The appropriate window parameters can be set automatically from BASIC by PEEKing 163890 and looking at VER$, as the demonstration program shows.

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/* Due to lack of space the program will be in the next issue. LFH */

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